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☐ 9297-68  
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8 October 1968

NRO REVIEW COMPLETED

MEMORANDUM FOR: Director of Operations, OSA  
ATTENTION : Special Action Staff, OSA  
SUBJECT : Quarterly Program Progress Report  
Deputy for Research and Development  
(July, August, September 1968)

Attached is the Deputy for Research and Development,  
OSA Quarterly Program Progress Report for the quarter  
ending 30 September 1968.

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Deputy for  
Research and Development  
Special Activities

Attachment:  
Quarterly Program  
Progress Report

Distribution:  
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4 - RB/OSA

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QUARTERLY PROGRAM PROGRESS REPORT

Deputy for Research and Development

July, August, September 1968

I. OXCART

A. Life Support

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During 11-12 July a meeting was held [ ] to determine distribution of OXCART life support assets. Items were identified for storage as part of the 5/90 kit, for loan from the 5/90 kit to [ ]

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[ ] or for permanent transfer to [ ]  
[ ] Appropriate depots have taken action to comply with these requirements.

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II. IDEALIST

A. U-2R Development Summary

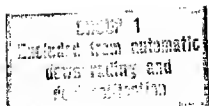
1. Airframe - A U-2R technical meeting was held at LAC, Burbank, to review the status of significant problems affecting the U-2R progress as well as the status of the aircraft performance as affected by excessive weight and drag and engine thrust deficiencies. A detailed report (IDEA-0746-68) has been written summarizing the significant results of this meeting.
2. Propulsion - Operation of a J75 engine on the East Hartford test stand resulted in the development of an orifice in the main oil pump to boost pump pressure sense line which dampens the interaction between the two pumps and apparently caused the oil pressure fluctuations. Two of these orifices have been utilized in installed engines on a trial basis. More than 56 flight hours have been accumulated to date with no report of oil pressure fluctuations.

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3. Life Support - [redacted]  
[redacted] received partial pressure suit/  
altitude chamber indoctrinations at the  
Castle AFB physiological training unit during  
the period 15-18 July.

U-2R Life Support System

- a. S-1010 PPA Fittings/Altitude Chamber  
Indoctrinations - The following  
individuals were fitted and given indoctri-  
nation:

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	28-30 July 1968
	19-23 Aug 1968
	19-23 Aug 1968
	23-25 Sept 1968

- b. Parasail Evaluations - The S-1010 PPA/U-2R  
Seat Kit were evaluated with respect to  
their protective and safety features related  
to parachute descent, water entry, parachute  
canopy release and suit flotation during  
parasail evaluations conducted at Lake  
Mead, Nevada, during 8-10 July 1968. Results  
were very satisfactory.
- c. U-2R Air Conditioning - A meeting was held  
on 6 August 1968 to review and discuss the  
U-2R air conditioning system deficiencies,  
modifications and test data. The deficiencies  
have been apparently resolved by the latest  
modifications and no further problems are  
anticipated.
- d. Underwater Escape Evaluations - An evaluation  
program was conducted at Miramar NAS, San  
Diego, California, on 7-8 August 1968 to  
evaluate and develop procedures for emergency  
egress from a submerged U-2R cockpit, to  
evaluate the S-1010 PPA and U-2R seat kit  
under submerged conditions, and to evaluate  
the training value of such an exercise for  
project pilots involved in U-2R carrier  
operations. Specific escape procedures were  
developed and U-2R life support equipment  
proved to provide excellent protection under  
such emergency conditions. A training program  
will be established for all project pilots involved.

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e. S-1010 PPA Refit and Evaluation Program - A series of problems regarding comfort and possible safety of the S-1010 PPA were brought out during July and August 1968 by the Detachment G commander. A meeting was held at Detachment G on 5 August 1968 to outline a course of action to resolve such problems. A suit refitting effort was undertaken by Detachment G life support personnel, followed by cockpit and/or in-flight evaluations. These efforts did not yield completely satisfactory results, so additional efforts and evaluations were conducted during the period 26-30 August 1968. All project pilots, [redacted] now have completely safe assemblies and the majority of comfort problems have also been resolved.

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f. Developmental Efforts - The David Clark Company is presently working on the development of several modifications/changes to the S-1010 PPA to improve comfort, reliability, safety and ease of maintenance. Included are the following:

- (1) Incorporation of a full-size sunshade.
- (2) Improved helmet microphone mounting.
- (3) New antisuffocation valve which can be manually closed.
- (4) Methods for reducing lateral torque of neck ring subassembly.
- (5) Insulation pads for suit vent system for protection from frostbite due to aircraft air conditioning modifications.

4. Payload - Flight verification tests were conducted during this period with A-1 and A-2 camera systems as well as with the H camera, B-1 and B-2 cameras, DELTA III and T-35 tracker. The [redacted]

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[redacted] borrowed from USAF assets has been flight demonstrated in the U-2R. An "H" hatch was used to confirm compatibility requirements and design characteristics for the [redacted] scheduled for delivery in December 1968. Camera production

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is on schedule. Flight tests conducted under high humidity conditions at McCoy AFB with a B-2 configuration yielded satisfactory results.

III. GENERAL R&D

- A. Drag Reduction Program - The wind tunnel program has demonstrated clear gains in drag reduction and the necessity for an appropriate analytical model to provide specific design criteria for the diffusers to obtain further drag reductions. Development of the analytical model is underway.

The DD/S&T, D/NRO, Dr. Jones and Dr. Allen of NASA, Ames, and LAC personnel were all briefed on the drag reduction program. NASA will schedule wind tunnel test time during the next quarter to test a larger scale model at higher Reynolds numbers and Mach numbers.

B.



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- C. Propulsion - High Altitude Engine Relight Program - A program has been initiated with Pratt & Whitney and Lockheed to develop a system for improving the altitude relight envelope of the J75-P-13B engine in the U-2R aircraft through use of oxygen injection. The program at Pratt & Whitney is progressing on schedule. All hardware is to be delivered by early October with engine endurance testing beginning two weeks after delivery of hardware. A fuel control

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has been modified by [redacted] and bench tests began in September. Some delay may occur in the scheduled date for delivery of hardware to Lockheed due to an aircraft interference problem with some of the oxygen supply lines. The date of delivery of hardware to Lockheed will be revised when the interference problem has been resolved. The target date for resolution of this interference problem has been set for 1 October.

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- D. Haze Attenuation Study - During September four flight tests were conducted at Albuquerque, New Mexico with S0121, S0230, and 3400 films using various combinations of polarizing and haze filters. Results of these tests will be analyzed by NPIC to determine the value of the polarizing filter for operational use.

IV. MISCELLANEOUS

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- A. Methane Fuel Technology - A briefing by [redacted] and [redacted] of R&D was held with Mr. Joe Jones (Assistant Secretary of the Air Force for R&D) on

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13 September 1968 on methane fuel technology for airbreathing engines. The program which R&D had originally proposed to NRO for FY-68 and FY-69 was reviewed with Mr. Jones. This involved a four phase effort leading up to test operation of a complete engine using methane fuel. Mr. Jones indicated interest in NRO fundings of a limited portion of this effort. After a visit by PSD to P&W (FRDC) during October for an updating of the overall P&W Methane effort, a briefing will be assembled for presentation to NRO by OSA, outlining a proposed program.

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